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7590 03/23/2005

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Gwendoline Bruneau	(Depositor's name)
Gbruneau	(Signature)
April 18, 2005	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,886	07/10/2001	Gholamabbas Hemiari	ML/10857.321	5826

04/25/2005 DEMMANU2 00000087 071742 09900886

TITLE OF INVENTION: SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

01 FC:1501 1400.00 DA
02 FC:1504 300.00 DA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1400	$300	$1700	06/23/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
DESIRE, GREGORY M	2625	382-190000

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☒ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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Authorized Signature Gbruneau Date April 18, 2005

Typed or printed name GWENDOLINE BRUNEAU Registration No. 55,916

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09/20/2005 SDIRETA2 00000001 071742 09900886

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Adjustment Date: 09/20/2005 SDIRETA1 09900886
04/25/2005 DEMMANU2 00000087 071742
01 FC:1501 1400.00 CR
02 FC:1504 300.00 CR

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket №: GB/10847.321

Applicant:	**Gholamabbas Hemiari et al.**
Serial:	**09/900,886**
Filed:	**07/10/2001**
Group Art Unit::	**2625**
Examiner:	**Desire, Gregory M.**
Title:	**SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY**

REQUEST FOR REFUND

Office of Finance
Fax: 571-273-6500

Sirs:

A fee of 500.00 USD was charged to deposit account 07-1742 on March 17, 2005 under fee code 2201 for independent claims in excess of three. The above application has only two independent claims. Please find enclosed a listing of the claims as of March 17, 2005.

A utility issue fee of 1,400.00 USD for large entity was charged to deposit account 07-1742 on April 25, 2005. The Assignee of this application, Université de Sherbrooke, being an institution of higher education, claimed small entity status under 37CFR 1.28. Please find enclosed the document where the small entity box was checked.

Therefore, please credit our deposit account 07-1742 in the amount of 1,200.00 USD.

Respectfully submitted,

July 29, 2005

Gwendoline Bruneau
Reg. № 55,916

Gwendoline Bruneau
GOUDREAU GAGE DUBUC
3400 Stock Exchange Tower
P O Box 242, 800 Place Victoria
Montreal (Quebec) Canada H4Z 1E9
Telephone : (514) 397-5195
E-mail : gbruneau@ggd.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Our File:	10857.321 GB/al
Applicant:	Gholamabbas Hemiari et al.
Serial No.:	09/900,886
Filed:	07/10/2001
Group Art Unit	2625
Examiner:	Desire, Gregory M.
Title:	SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
U.S.A.

Dear Sirs:

In response to the Official Action mailed on September 23,2004, in connection with the above-identified patent application, please consider the following amendments and remarks. Response to the Office Action is due on December 23, 2004, with a possible additional three-month (3) extension of time.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace prior versions and listings of claims in the application.

Listing of claims:

Claims 1, 5-9, 13-15 have been amended, and claims 2-4 and 10-12 have been withdrawn as follows: Underlines indicate insertions and ~~strikeouts~~ indicate deletions.

1. (Currently amended) A method for ~~the~~ extraction of linear features from digital imagery, comprising the steps of:

providing a digital image;

providing a multi-layer database;

initializing a parameter domain;

successively applying ~~the~~ a Radon transform on each position in the parameter domain;

for each position in the parameter domain:

finding ~~the~~ coordinates of ~~the~~ a nearest pixel in the digital image;

determining ~~the~~ a numerical value of the ~~found~~ nearest pixel; and

populating ~~the~~ layers of the ~~provided~~ multi-layer database in accordance with the ~~determined~~ numerical value of the ~~found~~ nearest pixel;

analysing ~~the~~ data of the multi-layer database for linear features; and

generating an output image by restoring the ~~lines~~ detected linear features ~~in the analysing step~~.;

wherein said step of providing a multi-layer database includes providing a multi-layer database having at least five layers: a first layer used to contain coordinates of zero value pixels; a second layer used to contain coordinates of non-zero value pixels; a third layer used to contain values of the non-zero value pixels; a

fourth layer used to contain ~~the~~ values of the zero value pixels, and a fifth layer used to contain an accumulation of the non-zero pixel values.

2. (Withdrawn) ~~A method for the extraction of linear features as recited in claim 1, wherein the multi layer database providing step includes providing a multi-layer database having at least three layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non zero value pixels and a third layer used to contain the values of the non-zero value pixels.~~

3. (Withdrawn) ~~A method for the extraction of linear features as recited in claim 2, wherein, in said populating step:~~

~~the coordinates of the found pixel are stored in the first layer when the numerical value of the pixel is found to be zero;~~

~~the coordinates of the found pixel are stored in the second layer when the numerical value of the pixel is found to be non zero;~~

~~the numerical value of the non zero pixels is stored in the third layer~~.

4. (Withdrawn) ~~A method for the extraction of linear features as recited in claim 1, wherein the multi layer database providing step includes providing a multi-layer database having at least five layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non zero value pixels; a third layer used to contain the values of the non-zero value pixels; a fourth layer used to contain the values of the zero value pixels and a fifth layer used to contain the accumulation of the non-zero pixel values.~~

5. (Currently amended) A <u>The</u> method for the extraction of linear features as recited in claim 4 <u>1</u>, wherein, ~~in~~ said <u>step of</u> populating ~~step~~ <u>the layers of the multi-layer database comprises</u>:

<u>storing</u> the coordinates of the ~~found~~ <u>nearest</u> pixel ~~are stored~~ in the first layer when the numerical value of the <u>nearest</u> pixel is found to be below a predetermined threshold;

storing the coordinates of the ~~found~~ nearest pixel ~~are stored~~ in the second layer when the numerical value of the nearest pixel is found to be above the predetermined threshold;

storing ~~the~~ a numerical value of ~~the~~ pixels having a value which is above the predetermined threshold ~~is stored~~ in the third layer;

storing ~~the~~ a numerical value of ~~the~~ pixels having a value which is below the predetermined threshold ~~is stored~~ in the fourth layer; and

storing ~~the~~ an accumulation of the numerical value of ~~the~~ pixels that have a numerical value which is above the predetermined threshold ~~is stored~~ in the fifth layer.

6. (Currently amended) ~~A~~ The method for the extraction of linear features as recited in claim 1, wherein said ~~data analysing~~ step of analysing the data of the multi-layer database includes the substep of finding ~~the~~ endpoints of each linear feature to be extracted.

7. (Currently amended) ~~A~~ The method for the extraction of linear features as recited in claim 6, further comprising the step of storing the endpoints found in a database ~~which is~~ used in ~~the output image generating~~ said step of generating the output image.

8. (Currently amended) ~~A~~ The method for the extraction of linear features as recited in claim 1, further comprising the step of providing ~~the~~ a minimum and a maximum length of the ~~lines~~ linear features to be detected.

9. (Currently amended) A system for ~~the~~ extraction of linear features from a digital image and for generating a corresponding output image, comprising:

a controller provided with an input designed to receive a digital image and an output designed to provide a corresponding output image; said controller containing a multi-layer database; said controller being so configured as to:

initialize ~~the~~ a discrete parameter domain;

successively apply a Radon transform on each position in the parameter domain;

for each position in the parameter domain:

find ~~the~~ coordinates of ~~the~~ a nearest pixel in the digital image;

determine ~~the~~ a numerical value of the ~~found~~ nearest pixel; and

populate ~~the~~ layers of the ~~provided~~ multi-layer database in accordance with the ~~determined~~ numerical value of the ~~found~~ nearest pixel;

analyse ~~the~~ data of the multi-layer database to detect linear features; and

generate an output image by restoring the ~~lines~~ detected linear features ~~in the analysing step.~~;

wherein the multi-layer database includes at least five layers: a first layer used to contain coordinates of zero value pixels; a second layer used to contain coordinates of non-zero value pixels; a third layer used to contain values of the non-zero value pixels; a fourth layer used to contain values of the zero value pixels, and a fifth layer used to contain an accumulation of the non-zero pixel values.

10. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 9, wherein the multi-layer database includes at least three layers; a first layer used to contain the coordinates of the zero value pixels; a second layer used to contain the coordinates of the non-zero value pixels and a third layer used to contain the values of the non-zero value pixels.~~

11. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 10, wherein, when populating the database, the controller is so configured as to:~~

~~store the coordinates of the found pixel in the first layer when the numerical value of the pixel is found to be zero;~~

~~store the coordinates of the found pixel in the second layer when the numerical value of the pixel is found to be non-zero;~~

~~store the numerical value of the non-zero pixels in the third layer.~~

12. (Withdrawn) ~~A system for the extraction of linear features as recited in claim 9, wherein the multi-layer database includes at least five layers; a first layer used to contain the coordinates of the zero value pixels; a second layer~~

~~used to contain the coordinates of the non-zero value pixels; a third layer used to contain the values of the non-zero value pixels; a fourth layer used to contain the values of the zero value pixels and a fifth layer used to contain the accumulation of the non-zero pixel values.~~

13. (Currently amended) A The system for the extraction of linear features as recited in claim 9 ~~12~~, wherein, when populating the layers of the multi-layer database, the controller is so configured as to:

store the coordinates of the ~~found~~ nearest pixel in the first layer when the numerical value of the nearest pixel is found to be below a predetermined threshold;

store the coordinates of the ~~found~~ nearest pixel in the second layer when the numerical value of the nearest pixel is found to be above the predetermined threshold;

store ~~the~~ a numerical value of ~~the~~ pixels having a value which is above the predetermined threshold in the third layer;

store ~~the~~ a numerical value of ~~the~~ pixels having a value which is below the predetermined threshold in the fourth layer; and

store ~~the~~ an accumulation of the numerical value of the pixels that have a numerical value which is above the predetermined threshold in the fifth layer.

14. (Currently amended) A The system for the extraction of linear features as recited in claim 9, further comprising an output device connected to said output of said controller to receive the output image generated by said controller.

15. (Currently amended) A The system for the extraction of linear features as recited in claim 9, further comprising an input device connected to said input of said controller to supply the digital image to the controller.

REMARKS

Claims 1, 5 to 9, and 13 to 15 remain in the case.

Reconsideration of this Application and entry of the foregoing amendments are requested. Claims 1 and 9 have been amended in view of the Office Action and to better define what the Applicants consider their invention, as fully supported by an enabling disclosure. Claims 2-4 and 10-12 have been withdrawn and the remaining claims have been amended to correct clerical errors.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-2, 6-11 and 14-15 have been rejected under 35 U.S.C. § 103, first paragraph as being unpatentable over Maruo (6,259,809) in view of Bergman et al. (6,529,916). The Applicants respectfully traverse the rejection as follows.

Although Applicant believes that neither Maruo (6,259,809) nor Bergman et al. (6,529,916), alone or in combination, teach or even hint at a method as recited in the claims as examined, In order to expedite prosecution of the application, Applicant rewrites claims 4 and 12 as independent claims by incorporating the subject matter thereof in claims 1 and 9 respectively, and withdraws claims 2 to 4 and 10 to 12. Applicant consequently amends claims 5 and 13 to correct claim dependencies.

In view of the above and foregoing, it is respectfully requested that the Examiner withdraws his rejection of claims 1-2, 6-11 and 14-15 under 35 U.S.C. § 103.

Applicant further amends the claims to correct clerical errors.

The rejections of the original claims are believed to have been overcome by the present amendment. From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such an action is earnestly solicited.

Authorization is hereby given to charge deposit account no. 07-1742 for any deficiencies or overages in connection with this response.

Respectfully submitted,

GOUDREAU GAGE DUBUC

Jean H. Dubuc
Reg. No. 26,374

Date: December 14, 2004

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Gwendoline Bruneau	(Depositor's name)
Gbruneau	(Signature)
April 18, 2005	(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/900,886	07/10/2001	Gholamabbas Hemiari	ML/10857.321	5875

TITLE OF INVENTION. SYSTEM AND METHOD FOR THE AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM DIGITAL IMAGERY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
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EXAMINER	ART UNIT	CLASS-SUBCLASS
DESIRE, GREGORY M	2625	382-190000

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Authorized Signature Gbruneau Date April 18, 2005

Typed or printed name GWENDOLINE BRUNEAU Registration No. 55,916

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